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KANESAKA AND TAKEUCHI
1423 Powhatan Street
Alexandria, VA 22314

EXAMINER

PIZIALI, ANDREW T

ART UNIT	PAPER NUMBER
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1771

DATE MAILED: 02/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/987,971

Applicant(s)

NISHIDA ET AL.

Examiner

Andrew T Piziali

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 December 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 14-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 14-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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DETAILED ACTION

Response to Amendment

1. The amendment filed on 12/9/2003 has been entered. The examiner has withdrawn the 35 USC 112 rejections based on the amendment to claim 1. The examiner has withdrawn the 35 USC 103 rejections of claims 7-10 because the amendment canceled these claims.

Claim Objections

2. Claim 1 is objected to because of the following informalities: In line 2, the phrase "an organic" should read "an organic film." Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1 and 14-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 5,925,438 to Ota et al (hereinafter referred to as Ota) in view of USPN 5,665,422 to Endo et al. (hereinafter referred to as Endo).

Regarding claims 1 and 14-17, Ota discloses an antireflection film, suitable for use in a liquid crystal display or a window glass for automobiles (column 1, lines 4-12), comprising an organic film, a hard-coating layer, a high refractive index layer, and a low refractive index layer (paragraph bridging columns 2 and 3, Figure 3).

Ota discloses that the high refractive index layer may comprise a resin with fine particles dispersed therein (column 8, lines 16-22). Ota discloses that the particles that may be dispersed

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in the resin include TiO_2 , SnO_2 , and ITO (column 8, lines 36-46). Ota also discloses that the resin in the high refractive index layer may be polystyrene (column 8, lines 23-35). Ota fails to specifically mention the use of two different particles dispersed in a resin for the high refractive index layer, but Endo discloses an antireflection film, suitable for use in a liquid crystal display or in a window glass for automobiles (column 3, lines 61-67), comprising an organic film (column 9, lines 23-35), a high refractive index layer including acrylic resin and one or more types of metal oxide particles, and a low refractive index layer (column 6, lines 17-24, paragraph bridging columns 7 and 8, paragraph bridging columns 8 and 9, and column 14, lines 43-60). Endo discloses that "As the ultrafine particles having a high refractive index and a light-transmitting and electrically conductive function...there can be exemplified metal oxides such as SnO_2 , In_2O_3 , TiO_2 and ZrO_2 and mixtures thereof" (paragraph bridging columns 8 and 9). Endo discloses that by producing a high refractive index layer with two different metal oxides the high refractive index layer can be formed with excellent light-transmitting properties as well as high electrical conductivity (paragraph bridging column 8 and 9). It would have been obvious to one having ordinary skill in the art at the time the invention was made to make the high refractive index layer of Ota comprise acrylic resin, TiO_2 particles and ITO particles, as taught by Endo, because in combination the two particles provide the layer with excellent light-transmitting properties and high electrical conductivity, properties desired in some antireflection film applications.

Endo does not mention the specific volume percentage of the particles of TiO_2 to the total volume of the particles of TiO_2 and the particles of ITO, but it would have been obvious to one having ordinary skill in the art at the time the invention was made to adjust the volume

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percentages of TiO_2 and ITO particles to acquire the desired refractive index and the desired light transmitting and electrical conductivity properties for the intended application. It has been held that discovering an optimum value of a result effective variable involves only routine skill in the art.

Ota does not mention the specific volume percentage of metal oxide particles to the total volume of metal oxide particles and resin, but Ota does disclose that the type and amount of particles and resin may be changed so that the refractive index is within the range of 1.50 to 2.30 (column 8, lines 47-54). Considering that the applicant discloses that the claimed volume fraction/ratio of particles in the blend leads to the high index of refraction (1.65 to 1.85), and considering that the prior art teaches the claimed index of refraction, it appears that the prior art teaches and/or suggests the claimed volume fraction/ratio of particles.

The Patent and Trademark Office can require applicants to prove that prior art products do not necessarily or inherently possess characteristics of claimed products where claimed and prior art products are identical or substantially identical, or are produced by identical or substantially identical processes; burden of proof is on applicants where rejection based on inherency under 35 U.S.C. § 102 or on prima facie obviousness under 35 U.S.C. § 103, jointly or alternatively, and Patent and Trademark Office's inability to manufacture products or to obtain and compare prior art products evidences fairness of this rejection, *In re Best, Bolton, and Shaw*, 195 USPQ 431 (CCPA 1977).

Ota discloses that the low refractive index layer may be a silica gel (column 5, lines 10-16), but does not specifically mention the use of an acrylic resin and fluorine resin particles. Endo discloses that a low refractive index layer may comprise an acrylic resin with particles of

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silica or magnesium fluoride to lower the refractive index of the layer (column 6, lines 6-16). It would have been obvious to one having ordinary skill in the art at the time the invention was made to make the low refractive index layer of Ota from a material comprising a binder and any equivalent suitable low refractive index particle material, such as disclosed by the Endo, because it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use.

Endo does not specifically mention the weight percent of particles in the low refractive index layer, but Ota teaches that it is preferable that the low refractive index layer be formed with a refractive index in the range of 1.38 to 1.46 (column 5, lines 10-15). Considering that the applicant discloses that the claimed weight percent of particles leads to the low index of refraction (1.35 to 1.55), and considering that the prior art teaches the claimed index of refraction, it appears that the prior art teaches and/or suggests the claimed weight percent of particles.

Ota discloses that it is preferable that the high refractive index layer be formed with a refractive index in the range of 1.50 to 2.30 (column 8, lines 47-65) and that the low refractive index layer be formed with a refractive index in the range of 1.38 to 1.46 (column 5, lines 10-15).

Considering the substantially identical antireflection film of Ota in view of Endo, compared to the applicant's antireflection film, it appears that the antireflection film of Ota in view of Endo would possess a surface resistance of $5 \times 10^{12} \Omega/\square$ or less, as claimed by the applicant.

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Regarding claims 14-17, Ota discloses that the hard coating layer may include ITO particles (column 4, lines 27-41).

Regarding claim 15, Ota does not specifically mention the volume percent of metal oxide particles to the total volume of the metal oxide particles and the resin, but Ota does disclose that the type and amount of particles and resin may be changed so that the refractive index is within the range of 1.50 to 2.30 (column 8, lines 47-54). Considering that the applicant discloses that the claimed volume fraction/ratio leads to the high index of refraction (1.65 to 1.85), and considering that the prior art teaches the claimed index of refraction, it appears that the prior art teaches and/or suggests the claimed volume fraction/ratio.

Regarding claim 16, Ota discloses that the high refractive index layer may have a thickness of between 75 and 90nm (column 8, lines 47-65) and the low refractive index layer may have a thickness of between 85 and 110 nm (column 6, lines 43-52).

Regarding claim 17, Ota discloses that the low refractive index layer be formed with a refractive index of less than 1.45 (column 5, lines 10-15).

5. Claims 1 and 14-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ota in view of Endo as applied to claims 1 and 14-17 above, and further in view of USPN 5,909,314 to Oka et al. (hereinafter referred to as Oka).

Endo discloses that the low refractive index layer may comprise a binder with particles of silica or magnesium fluoride to lower the refractive index of the layer (column 6, lines 6-16).

Oka discloses that it is known to make a low refractive index layer from an acrylic resin containing 10% by weight of particles of magnesium fluoride (see entire document including column 10, lines 14-31, column 18, lines 25-42, and column 34, lines 33-44). It would have

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been obvious to one having ordinary skill in the art at the time the invention was made to make the low refractive index layer of Ota from a material comprising a binder, such as an acrylic binder, as disclosed by Oka, and any suitable low refractive index particle material, as disclosed by Endo and Oka, because it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use.

6. Claims 1 and 14-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 5,665,422 to Endo in view of USPN 5,925,438 to Ota.

Regarding claims 1 and 14-17, Endo discloses an antireflection film, suitable for use in a liquid crystal display or in a window glass for automobiles (column 3, lines 61-67), comprising an organic film (column 9, lines 23-35), a high refractive index layer including at least two kinds of metal oxide particles, and a low refractive index layer (paragraph bridging columns 8 and 9 and column 14, lines 43-60). Endo discloses that "As the ultrafine particles having a high refractive index and a light-transmitting and electrically conductive function...there can be exemplified metal oxides such as SnO_2 , In_2O_3 , TiO_2 and ZrO_2 and mixtures thereof" (paragraph bridging columns 8 and 9). Endo discloses that the resin in the high refractive index layer may be an acrylic resin (column 6, lines 17-23).

Endo fails to mention the use of a hard-coating layer, but Ota discloses an antireflection film, suitable for use in a liquid crystal display or a window glass for automobiles (column 1, lines 4-12), comprising an organic film, a hard-coating layer to provide abrasion resistance, a high refractive index layer, and a low refractive index layer (paragraph bridging columns 2 and 3, Figure 3). It would have been obvious to one having ordinary skill in the art at the time the

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invention was made to include a hard-coating layer, as disclosed by Ota, in the antireflection film of Endo, because the hard-coating layer provides abrasion resistance for the substrate.

Endo does not mention the specific volume percentage of the particles of TiO_2 to the total volume of the particles of TiO_2 and the particles of ITO, but it would have been obvious to one having ordinary skill in the art at the time the invention was made to adjust the volume percentages of TiO_2 and ITO particles to acquire a high refractive index layer with the desired light transmitting and electrical conductivity properties for the intended application.

Endo discloses that the high refractive index layer comprises synthetic resin as a result of the synthetic resin of the low refractive index layer flowing down into the high refractive index layer (paragraph bridging column 7 and 8 and Figure 7). Endo does not mention specific volume percentages of metal oxide particles to the total volume of metal oxide particles and resin, but Ota discloses that the type and amount of particles and resin may be changed in a high refractive index layer so that the refractive index is within the range of 1.50 to 2.30 (column 8, lines 47-54). Considering that the applicant discloses that the claimed volume fraction/ratio of particles in the blend leads to the high index of refraction (1.65 to 1.85), and considering that the prior art teaches the claimed index of refraction, it appears that the prior art teaches and/or suggests the claimed volume fraction/ratio of particles.

Endo discloses that the low refractive index layer may comprise an acrylic resin with particles of silica or magnesium fluoride to lower the refractive index of the layer (column 6, lines 6-16). Endo does not specifically mention the weight percent of particles in the low refractive index layer, but Ota teaches that it is preferable that a low refractive index layer be formed with a refractive index in the range of 1.38 to 1.46 (column 5, lines 10-15). Considering

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that the applicant discloses that the claimed weight percent of particles leads to the low index of refraction (1.35 to 1.55), and considering that the prior art teaches the claimed index of refraction, it appears that the prior art teaches and/or suggests the claimed weight percent of particles.

Endo does not mention the surface resistance of the antireflection film, but considering the substantially identical antireflection film of Endo in view of Ota, compared to the applicant's antireflection film, it appears that the antireflection film of Endo in view of Ota would possess a surface resistance of $5 \times 10^{12} \Omega/\square$ or less, as claimed by the applicant.

Endo discloses that the high refractive index layer may comprise TiO_2 particles in an admixture with ITO particles (paragraph bridging column 8 and 9). Endo discloses that a low refractive index layer may comprise an acrylic resin with particles of silica or magnesium fluoride to lower the refractive index of the layer (column 6, lines 6-16). Endo does not mention the specific refractive indices of the high and low refractive index layers, but it would have been obvious to one having ordinary skill in the art at the time the invention was made to adjust the volume percentages of constituents in the high and low refractive index layers to acquire the desired refractive index for the intended application.

Regarding claims 14-17, Ota discloses that the hard coating layer may include ITO particles (column 4, lines 27-41).

Regarding claim 15, Ota does not specifically mention the volume percent of metal oxide particles to the total volume of the metal oxide particles and resin, but Ota does disclose that the type and amount of particles and resin may be changed so that the refractive index is within the range of 1.50 to 2.30 (column 8, lines 47-54). Considering that the applicant discloses that the

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claimed volume fraction/ratio leads to the high index of refraction (1.65 to 1.85), and considering that the prior art teaches the claimed index of refraction, it appears that the prior art teaches and/or suggests the claimed volume fraction/ratio.

Regarding claim 16, Endo does not mention the high and low refractive index layer thickness ranges, but Ota discloses that the high refractive index layer may have a thickness of between 75 and 90nm (column 8, lines 47-65) and the low refractive index layer may have a thickness of between 85 and 110 nm (column 6, lines 43-52). It would have been obvious to one having ordinary skill in the art at the time the invention was made to vary the thickness of the layers, as taught by Ota, because it is understood by one of ordinary skill in the art that the layer thicknesses determine properties such as refractive index, transmittance, emissivity, and color and because it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art.

7. Claims 1 and 14-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Endo in view of Ota as applied to claims 1 and 14-17 above, and further in view of USPN 5,909,314 to Oka.

Endo discloses that the low refractive index layer may comprise a binder with particles of silica or magnesium fluoride to lower the refractive index of the layer (column 6, lines 6-16). Oka discloses that it is known to make a low refractive index layer from an acrylic resin containing 10% by weight of particles of magnesium fluoride (see entire document including column 10, lines 14-31, column 18, lines 25-42, and column 34, lines 33-44). It would have been obvious to one having ordinary skill in the art at the time the invention was made to make the low refractive index layer of Endo from a material comprising a binder, such as an acrylic

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binder, as disclosed by Oka, and any suitable low refractive index particle material, as disclosed by Endo and Oka, because it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use.

Response to Arguments

8. Applicant's arguments filed 12/9/2003 have been fully considered but they are not persuasive.

The applicant asserts that the combination of particles in the high refractive index layer, and the claimed specific volume percentage, are not disclosed or suggested in Ota. The examiner contends that Ota in view of Endo, not Ota alone, is relied upon to teach the combination of particles and the specific volume percentage.

Ota discloses that the high refractive index layer may comprise a resin with fine particles dispersed therein (column 8, lines 16-22). Ota discloses that the particles that may be dispersed in the resin include TiO_2 , SnO_2 , and ITO (column 8, lines 36-46). Ota also discloses that the resin in the high refractive index layer may be polystyrene (column 8, lines 23-35). Ota fails to specifically mention the use of two different particles dispersed in a resin for the high refractive index layer, but Endo discloses an antireflection film, suitable for use in a liquid crystal display or in a window glass for automobiles (column 3, lines 61-67), comprising an organic film (column 9, lines 23-35), a high refractive index layer including acrylic resin and one or more types of metal oxide particles, and a low refractive index layer (column 6, lines 17-24, paragraph bridging columns 7 and 8, paragraph bridging columns 8 and 9, and column 14, lines 43-60). Endo discloses that "As the ultrafine particles having a high refractive index and a light-transmitting and electrically conductive function...there can be exemplified metal oxides such as

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SnO₂, In₂O₃, TiO₂ and ZrO₂ and mixtures thereof" (paragraph bridging columns 8 and 9). Endo discloses that by producing a high refractive index layer with two different metal oxides the high refractive index layer can be formed with excellent light-transmitting properties as well as high electrical conductivity (paragraph bridging column 8 and 9). It would have been obvious to one having ordinary skill in the art at the time the invention was made to make the high refractive index layer of Ota comprise acrylic resin, TiO₂ particles and ITO particles, as taught by Endo, because in combination the two particles provide the layer with excellent light-transmitting properties and high electrical conductivity, properties desired in some antireflection film applications.

Endo does not mention the specific volume percentage of the particles of TiO₂ to the total volume of the particles of TiO₂ and the particles of ITO, but it would have been obvious to one having ordinary skill in the art at the time the invention was made to adjust the volume percentages of TiO₂ and ITO particles to acquire the desired refractive index and the desired light transmitting and electrical conductivity properties for the intended application. It has been held that discovering an optimum value of a result effective variable involves only routine skill in the art.

The applicant asserts that the low refractive index layer of Ota is different from that of the claimed invention. The examiner contends that Ota in view of Endo, not Ota alone, is relied upon to teach the claimed low refractive index layer.

Ota discloses that the low refractive index layer may be a silica gel (column 5, lines 10-16), but does not specifically mention the use of an acrylic resin plus fluorine resin particles. Endo discloses that a low refractive index layer may comprise an acrylic resin with particles of

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silica or magnesium fluoride to lower the refractive index of the layer (column 6, lines 6-16). It would have been obvious to one having ordinary skill in the art at the time the invention was made to make the low refractive index layer of Ota from a material comprising a binder and any suitable low refractive index particle material, as disclosed by the Endo, because it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use.

The applicant asserts that in Endo TiO_2 is used, but the combination of ITO and TiO_2 is not disclosed or suggested. The examiner respectfully disagrees. Endo discloses that "As the ultrafine particles having a high refractive index and a light-transmitting and electrically conductive function...there can be exemplified metal oxides such as SnO_2 , In_2O_3 , TiO_2 and ZrO_2 and mixtures thereof" (paragraph bridging columns 8 and 9).

The applicant asserts that Endo fails to disclose the currently claimed low refractive index layer comprising acrylic resin and fluorine resin particles. The examiner respectfully disagrees. Endo discloses that the low refractive index layer may comprise an acrylic resin with particles of silica or magnesium fluoride (column 6, lines 6-16).

Conclusion

9. Applicant's amendment necessitated the new grounds of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after

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the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew T Piziali whose telephone number is (571) 272-1541. The examiner can normally be reached on Monday-Friday (8:00-4:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Terrel Morris can be reached on (571) 272-1478. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

atp


ANDREW T. PIZIALI
PATENT EXAMINER


TERREL MORRIS
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